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K. Stobus
Attorney for Applicant

October 21, 2004
Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of)
RICHARD T. EVERE)
Entitled:) Attorney Docket No. 0638
SYSTEM AND METHOD FOR SECURE) Group Art Unit 2122
INSTALLATION AND OPERATION OF) Application Serial No. 10/785,579
SOFTWARE)
Filed: February 23, 2004)

600 Grant Street, 44th Floor
Pittsburgh, PA 15219
October 21, 2004

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION TO MAKE SPECIAL PURSUANT TO 37 CFR 1.102(d)

Dear Sir:

Applicant, through the undersigned attorney, hereby petitions to make the above-captioned Application special pursuant to 37 CFR 1.102(d) and, in particular, pursuant to MPEP 708.02, VIII.

It is believed that the Application has not yet received any examination by the examiner and, therefore, may be granted special status in view of the following items:

- (A) A Fee Sheet and duplicate copy thereof accompany this Petition, in order to pay the fee set forth in 37 CFR 1.17(h).
- (B) It is submitted that Claims 1-20 of the Application are directed to a single invention.

(C) Attached hereto as Exhibit 1 is a true and correct copy of a Communication from the European Patent Office including the European search report for the corresponding European Application No. 04250954.7, filed February 23, 2004. Attached hereto as Exhibit 2 is a true and correct copy of Claims 1-20 of said European Application. It is submitted that the claims of said European Application are of the same or similar scope to Claims 1-20 of the present Application.

(D) Attached hereto as Exhibit 3 are three references, which are identified in the European search report as Documents D1, D2 and D3, which references are deemed most closely related to the subject matter encompassed by present Claims 1-20. Those references along with one additional reference (Document D4, category A: technological background) and the European search report are contemporaneously being made of record through an accompanying Supplemental Information Disclosure Statement.

(E) A detailed discussion of the references is set forth below, which discussion points out, with the requisite particularity, how the claimed subject matter is patentable over the references.

Detailed Discussion of the References

Document D1 (as identified by the European search report) discloses Primary and alternate data streams (ADSs) in the New Technology File System (NTFS) of Microsoft. This reference also discloses (page 7) that there is “malware” that takes advantage of ADSs (*e.g.*, W2k.stream).

Document D2 (as identified by the European search report) discloses that W2K.Stream is a virus that only replicates on Windows 2000 systems that use an NTFS partition. W2K.Stream utilizes an NTFS feature that exists on both Windows NT and Windows 2000. The virus writers believed that this particular feature did not exist on Windows NT and therefore reduced the virus to be Windows 2000 specific by having the virus check the OS version (similar to the W2K.Installer virus).

NTFS streams are virtually hidden from users. This is because NT commands or standard Windows 2000 applications do not display them. A given file on an NTFS partition is basically an unnamed stream of a file. Any file can have associated named streams. These streams can be accessed during standard file operations. Most Windows NT/2000 applications do not use named streams.

W2K.Stream virus is 3628 bytes. The virus is compressed with a popular Portable Executable (PE) file compressor called Petite. The actual virus code inside is very

short. First, the virus checks the Windows version of the current system. If it is not Windows 2000, then the virus displays a message.

The virus is basically a new subclass of companion viruses, a "stream companion" virus. When the virus infects a file it replaces the host application with itself. Basically the virus implements the simplest possible virus infection by overwriting the host program with its own code. In other words, each infected file will be 3628 bytes long. The trick of the virus is that it saves the original host application as a named stream of the host program.

The W2K.Stream proof-of-concept virus is based upon a "W2K.Installer" virus. The name of that virus is a misnomer because it uses a parasitic technique to take control of an executable file and insert a necessary component of itself into a "cavity" within the executable file. A cavity, in this instance, is a block of available space in the code segment of the executable file that would be large enough for the virus component to live in. After placement in the cavity, a change is made to the PE file header to execute the virus contained in the code segment. This parasitic method of placement takes advantage of a structural design defect of the Windows PE file structure where checksums are not employed to prevent execution of modified executable files. The W2K.Stream proof-of-concept virus uses an identical technique but went a step further by hiding itself in an Alternate Data Stream.

Document D3 (as identified by the European search report) discloses an installer (page 33), an end user license agreement (EULA) (page 32), and an installation file, an installation directory and an installation script (page 37) for a VMware Workstation.

Claim 1 recites a method for secure installation and operation of software, the method comprising: employing an NT File Structure logical volume; employing an installer; writing a Primary Data Stream file to the NT File Structure logical volume from the installer; associating data with the Primary Data Stream file; and writing the associated data to the NT File Structure logical volume as an Alternate Data Stream file from the installer.

Claim 1 recites employing an *installer*; writing a Primary Data Stream file to an NT File Structure logical volume from such *installer*; **and** writing associated data with the Primary Data Stream file and to the NT File Structure logical volume as an Alternate Data Stream file from such *installer*.

Documents D1 and D2 teach and suggest a W2K.Stream virus. When this virus infects a file it replaces a host application with itself. Basically, the virus implements the simplest possible virus infection by overwriting the host program with its own code.

For example, a virus is completely different from the recited *installer* and does not install or upgrade files in a traditional sense. Instead, a virus usually overwrites existing files or exists as a parasite within existing files. This view is confirmed by the express teachings of Documents D1 and D2, which state that the virus replaces a host application with itself. This view is also supported by Exhibit 4, which provides a definition of “virus” namely a “program that can ‘infect’ other programs by modifying them to include a, possibly evolved, copy of itself. A program that infects a computer by attaching itself to another program, and propagating itself when that program is executed.”

Furthermore, a malware virus is a “program or piece of code that is loaded onto your computer without your knowledge and runs against your wishes.” See Exhibit 5. This is completely different from a method for *secure* installation and operation of software.

Document D3 adds nothing to Documents D1 and D2 regarding writing a Primary Data Stream file or an Alternate Data Stream file to an NT File Structure logical volume from an installer.

The references, whether taken alone or in combination, do not teach or suggest the refined recital of employing an *installer*; writing a Primary Data Stream file to an NT File Structure logical volume from such *installer*; **and** writing associated data with the Primary Data Stream file and to the NT File Structure logical volume as an Alternate Data Stream file from such *installer*.

Accordingly, for the above reasons, Claim 1 patentably distinguishes over the references.

Claims 2-10 depend either directly or indirectly from Claim 1 and patentably distinguish over the references for the same reasons.

Furthermore, Claim 5 recites creating a Primary Data Stream directory chain; writing the Primary Data Stream directory chain to the NT File Structure logical volume from the *installer*; writing the Primary Data Stream file to the Primary Data Stream directory chain in the NT File Structure logical volume from the *installer*; associating the data with the Primary Data Stream directory chain or the Primary Data Stream file by creating and closing the Alternate Data Stream file; and *installing* the associated data to the NT File Structure logical volume as the Alternate Data Stream file from the *installer*.

Since the references neither teach nor suggest the refined recital of Claim 1, they clearly neither nor suggest these additional limitations which further patentably distinguish over the references.

Furthermore, Claim 6 recites employing an *installation* file comprising the Primary Data Stream file, the Alternate Data Stream file, installation instructions, the Primary Data Stream directory chain, and an End User License Agreement.

Claim 6 depends directly from Claim 5 and indirectly from Claim 1 and includes all of the limitations of those claims. Since the references neither teach nor suggest the refined recital of Claim 5, they clearly neither nor suggest these additional limitations which further patentably distinguish over the references.

Claim 7 recites displaying the installation instructions and the End User License Agreement from the *installation* file.

Since the references neither teach nor suggest the refined recital of Claim 6, they clearly neither nor suggest these additional limitations which further patentably distinguish over the references.

Furthermore, Claim 8 recites employing as the associated data first data; employing as the Alternate Data Stream file a first Alternate Data Stream file; employing second data; associating the second data with the Primary Data Stream file; and writing the associated second data to the NT File Structure logical volume as a second Alternate Data Stream file from the *installer*.

Since the references neither teach nor suggest the refined recital of Claim 1, they clearly neither nor suggest these additional limitations which further patentably distinguish over the references.

Furthermore, Claim 10 recites employing an *installation* file; defining in the installation file a Primary Data Stream directory chain, the Primary Data Stream file, the Alternate Data Stream file, and at least one information file; displaying the at least one information file from the installation file; creating the Primary Data Stream directory chain in the NT File Structure logical volume; copying the Primary Data Stream file from the installation file to the Primary Data Stream directory chain in the NT File Structure logical volume; and copying the Alternate Data Stream file from the installation file to the Primary Data Stream directory chain in the NT File Structure logical volume.

Since the references neither teach nor suggest the refined recital of Claim 1, they clearly neither nor suggest these additional limitations which further patentably distinguish over the references.

Claim 11 is an independent claim which recites, *inter alia*, a computer system for secure installation and operation of software comprising: a processor; a first drive adapted for access by the processor; a second drive adapted for access by the processor, the second

drive including an NT File Structure logical volume; and an installer operatively associated with the first drive, the installer cooperating with the processor to write a Primary Data Stream file to the NT File Structure logical volume, associate data with the Primary Data Stream file, and write the associated data to the NT File Structure logical volume as an Alternate Data Stream file.

For reasons that were discussed above in connection with Claim 1, a virus is completely different from the recited *installer* and does not install or upgrade files in a traditional sense. Instead, a virus usually overwrites existing files or exists as a parasite within existing files. This view is confirmed by the express teachings of Documents D1 and D2, which state that the virus replaces a host application with itself. Furthermore, a malware virus is a “program or piece of code that is loaded onto your computer without your knowledge and runs against your wishes.” This is completely different from a computer system for **secure** installation and operation of software.

Document D3 adds nothing to Documents D1 and D2 regarding writing a Primary Data Stream file or an Alternate Data Stream file to an NT File Structure logical volume from an installer.

The references, whether taken alone or in combination, do not teach or suggest the refined recital of a computer system for **secure** installation and operation of software comprising: an *installer* operatively associated with a first drive, such *installer* cooperating with a processor to write a Primary Data Stream file to an NT File Structure logical volume, associate data with such Primary Data Stream file, and write such associated data to such NT File Structure logical volume as an Alternate Data Stream file.

Claims 12-20 depend either directly or indirectly from Claim 11 and patentably distinguish over the references for the same reasons.

Furthermore, Claim 12 recites that the NT File Structure logical volume includes a directory chain or a system directory; and that the *installer* installs the Primary Data Stream file in the directory chain or the system directory of the NT File Structure logical volume.

Since the references neither teach nor suggest the refined recital of Claim 11, they clearly neither nor suggest these additional limitations which further patentably distinguish over the references.

Furthermore, Claim 16 recites that the *installer* cooperates with the processor to create a Primary Data Stream directory chain, to write the Primary Data Stream directory chain to the NT File Structure logical volume, to write the Primary Data Stream file to the

Primary Data Stream directory chain in the NT File Structure logical volume, to associate the data with the Primary Data Stream directory chain or the Primary Data Stream file, and to install the associated data to the NT File Structure logical volume as the Alternate Data Stream file.

Since the references neither teach nor suggest the refined recital of Claim 11, they clearly neither nor suggest these additional limitations which further patentably distinguish over the references.

Furthermore, Claim 17 recites that the *installer* comprises an *installation* file comprising the Primary Data Stream file, the Alternate Data Stream file, installation instructions, a Primary Data Stream directory chain, and an End User License Agreement.

Claim 17 further patentably distinguishes over the references for similar reasons as were discussed above in connection with Claim 6.

Furthermore, Claim 18 recites that the processor includes a display; and that the *installer* cooperates with the processor to display the installation instructions and the End User License Agreement on the display.

Claim 18 further patentably distinguishes over the references for similar reasons as were discussed above in connection with Claim 7.

Furthermore, Claim 20 recites that the processor includes a display; that the *installer* comprises an *installation* file including a Primary Data Stream directory chain, the Primary Data Stream file, the Alternate Data Stream file, and at least one information file; and that the *installer* cooperates with the processor to display the at least one information file from the installation file to the display, to create the Primary Data Stream directory chain in the NT File Structure logical volume, to copy the Primary Data Stream file from the installation file to the Primary Data Stream directory chain in the NT File Structure logical volume, and to copy the Alternate Data Stream file from the installation file to the Primary Data Stream directory chain in the NT File Structure logical volume.

Claim 20 further patentably distinguishes over the references for similar reasons as were discussed above in connection with Claim 10.

In view of the above, it is hereby requested that the above-captioned Application be made special pursuant to 37 CFR 1.102(d) and, in particular, pursuant to MPEP 708.02, VIII.

Respectfully submitted,



Kirk D. Houser
Registration No. 37,357
Attorney for Applicant

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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

FEE TRANSMITTAL

for FY 2005

Effective 10/01/2004. Patent fees are subject to annual revision.

 Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ 130.00)

Complete If Known

Application Number	10/785,579
Filing Date	February 23, 2004
First Named Inventor	RICHARD T. EVERES
Examiner Name	Not Known
Art Unit	2122
Attorney Docket No.	0638

METHOD OF PAYMENT (check all that apply)

 Check Credit card Money Order Other None
 Deposit Account:

Deposit Account Number
02-2556

Deposit Account Name
Eckert Seamans

The Director is authorized to: (check all that apply)

Charge fee(s) indicated below Credit any overpayments to deposit account

Charge any additional fee(s) or any underpayment of fee(s) to deposit account

Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1001 790	2001 395	Utility filing fee	
1002 350	2002 175	Design filing fee	
1003 550	2003 275	Plant filing fee	
1004 790	2004 395	Reissue filing fee	
1005 160	2005 80	Provisional filing fee	

SUBTOTAL (1) (\$)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	Independent Claims	Multiple Dependent	Extra Claims	Fee from below	Fee Paid
			-20** =	X	=
			- 3** =	X	=

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
1202 18	2202 9	Claims in excess of 20
1201 88	2201 44	Independent claims in excess of 3
1203 300	2203 150	Multiple dependent claim, if not paid
1204 88	2204 44	** Reissue Independent claims over original patent
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$)

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Small Entity

Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 50	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	1053 130	Non-English specification	
1812 2,520	1812 2,520	For filing a request for ex parte reexamination	
1804 920*	1804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	
1252 430	2252 215	Extension for reply within second month	
1253 980	2253 490	Extension for reply within third month	
1254 1,530	2254 765	Extension for reply within fourth month	
1255 2,080	2255 1,040	Extension for reply within fifth month	
1401 340	2401 170	Notice of Appeal	
1402 340	2402 170	Filing a brief in support of an appeal	
1403 300	2403 150	Request for oral hearing	
1451 1,510	1451 1,510	Petition to institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,370	2453 685	Petition to revive - unintentional	
1501 1,370	2501 685	Utility issue fee (or reissue)	
1502 490	2502 245	Design issue fee	
1503 660	2503 330	Plant issue fee	
1460 130	1460 130	Petitions to the Commissioner	130.00
1807 50	1807 50	Processing fee under 37 CFR 1.17(q)	
1806 180	1806 180	Submission of Information Disclosure Stmt	
8021 40	8021 40	Recording each patent assignment per property (times number of properties)	
1809 790	2809 395	Filing a submission after final rejection (37 CFR 1.129(e))	
1810 790	2810 395	For each additional invention to be examined (37 CFR 1.129(b))	
1801 790	2801 395	Request for Continued Examination (RCE)	
1802 900	1802 900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$ 130.00)

(Complete if applicable)

SUBMITTED BY			
Name (Print/Type)	Kirk D. Houser	Registration No. (Attorney/Agent)	37,357
Signature	October 21, 2004		

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**Europäisches
Patentamt**

Zweigstelle
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division

des brevets

Département à
La Haye
Division de la
recherche

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Kilburn & Strode,
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GRANDE BRETAGNE

K + S Received	
Entered:	
Date:	- 2 AUG 2004
Checked:	○
F/E	

Datum/Date
30.07.04

Zeichen/Ref./Réf. P36680EP/JJH	Anmeldung Nr./Application No./Demande n°./Patent Nr./Patent No./Brevet n°. 04250954.7-2211-
Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire Research In Motion Limited	

COMMUNICATION

The European Patent Office herewith transmits as an enclosure the European search report for the above-mentioned European patent application.

If applicable, copies of the documents cited in the European search report are attached.

Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well.

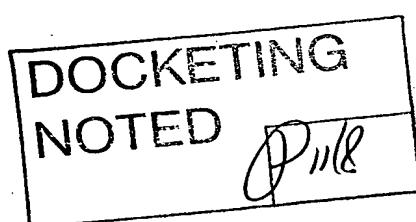
The following specifications given by the applicant have been approved by the Search Division:

abstract

title

The abstract was modified by the Search Division and the definitive text is attached to this communication.

The following figure will be published together with the abstract:



REFUND OF THE SEARCH FEE

If applicable under Article 10 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.





EUROPEAN SEARCH REPORT

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	HAL BERGHEL, NATASA BRAJKOVSKA: "Phishing in Alternate Data Streams" ASSOCIATION FOR COMPUTING MACHINERY, 'Online! 6 January 2004 (2004-01-06), XP002283088 Retrieved from the Internet: URL: http://www.acm.org/hlb/col-edit/digital_village/apr-04/dv_4-04.html > 'retrieved on 2004-06-02!	1,3-5,8, 9,11,12, 14-16,19	G06F9/445
Y	* page 1, section "Alternate Data Streams", paragraph 1 * * page 7, section "Security Implications of ADSs", paragraph 1 * * section "Origins", paragraph 1 * * page 3 * * section "URL Pearls:", paragraph 3 * * page 2, line 16 - page 3, line 9 * * figure 1 * -----	2,6,7, 10,13, 17,18,20	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
X	PETER SZOR: "W2K.Stream" SYMANTEC SECURITY RESPONSE HOMEPAGE, 'Online! 25 June 2003 (2003-06-25), XP002283089 Retrieved from the Internet: URL: http://web.archive.org/web/20030625134400/http://www.sarc.com/avcenter/venc/data/pf/w2k.stream.html > 'retrieved on 2004-06-02! * section "technical details", paragraph 3 - paragraph 8 * ----- -----	1,3-5,8, 9,11,12, 14-16,19	G06F
The present search report has been drawn up for all claims			
5	Place of search Munich	Date of completion of the search 12 July 2004	Examiner Milasinovic, G
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	<p>"VMware Workstation User's Manual Version 3.2" VMWARE HOMEPAGE, 'Online! 16 December 2002 (2002-12-16), XP002283090 Retrieved from the Internet: URL:http://www.vmware.com/pdf/ws32_manual.pdf > 'retrieved on 2004-06-03!</p> <p>* page 27 * * page 33, top figure * * page 32, bottom figure * * page 37 *</p> <p>-----</p> <p>"File Forks" APPLE DEVELOPER CONNECTION, 'Online! 2 July 1996 (1996-07-02), XP002283091 Retrieved from the Internet: URL:developer.apple.com/documentation/mac/Files/Files-14.html</p> <p>> 'retrieved on 2004-06-02! * paragraph '0002! *</p> <p>-----</p>	2,6,7, 10,13, 17,18,20	
A		1,3,4, 11,14,15	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
5	<p>The present search report has been drawn up for all claims</p>		
	Place of search	Date of completion of the search	Examiner
	Munich	12 July 2004	Milasinovic, G
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			



Erweiterter Europäischer Recherchenbericht
Extended European Search Report
Rapport de Recherche Européenne Élargi

Anmelde-Nr.: Application No.: 04 250 954 . 7
Demande no:

This application is covered by the extended European search report pilot project at present running within the European Patent Office, applied to all European patent applications filed as first filing and searched on or after 01.07.03. Under this project the EPO issues together with the search report an opinion on whether the application and the invention to which it relates meet the requirements of the EPC. This non-binding opinion is issued free of charge as a service. This opinion may be used as the basis for an informed decision as to whether it is desired to pursue the application further or not.

For further details of this pilot project, the applicant's attention is directed to the Official Journal edition 5/2003. If any further immediate questions or comments arise the EPO Customer Services: +31-70-340 4500 or +49-89-2399 2828 can be contacted.

The attached opinion reveals that the application or the invention to which it relates appear not to meet the requirements of the Convention (see comments on enclosed Form 2906).

If the applicant wishes to continue with this application the examination fee must be paid. Where appropriate amendments can be filed to address the objections raised in the opinion, thus shortening the overall procedure. If no amendments are filed, the opinion will be re-issued as the first official communication under Article 96(2) and Rule 51(2) EPC.

If the examination fee has already been paid and the right to the communication under Article 96(1) EPC has been waived for this application, the first official communication under Article 96(2) and Rule 51(2) EPC will be issued promptly.



Bescheid/Protokoll (Anlage)	Communication/Minutes (Annex)	Notification/Procès-verbal (Annexe)
Blatt Sheet Feuille	1	Anmelde-Nr.: Application No.: 04 250 954.7 Demande n°:

The examination is being carried out on the **following application documents**:

Text for the Contracting States:

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE SI SK TR LI

Description, pages:

1-15 as originally filed

Claims, No.:

1-20 as originally filed

Drawings, sheets:

1/4-4/4 as originally filed

1 Documents

1.1 The following documents are referred to in this communication; the numbering will be adhered to in the rest of the procedure:

- D1: HAL BERGHEL, NATASA BRAJKOVSKA: 'Phishing in Alternate Data Streams' ASSOCIATION FOR COMPUTING MACHINERY, [Online] 6 January 2004 (2004-01-06), XP002283088 Retrieved from the Internet: <URL:http://www.acm.org/hlb/col-edit/digital_village/apr-04/dv_4-04.html> [retrieved on 2004-06-02]
- D2: PETER SZOR: 'W2K.Stream' SYMANTEC SECURITY RESPONSE HOMEPAGE, [Online] 25 June 2003 (2003-06-25), XP002283089 Retrieved from the Internet: <URL:<http://web.archive.org/web/20030625134400/http://www.sarc.com/avcenter/venc/data/pf/w2k.stream.html>> [retrieved on 2004-06-02]
- D3: 'VMware Workstation User's Manual Version 3.2' VMWARE HOMEPAGE, [Online] 16 December 2002 (2002-12-16), XP002283090 Retrieved from the Internet: <URL:http://www.vmware.com/pdf/ws32_manual.pdf> [retrieved on 2004-06-03]

1.2 Documents D1-D3 belong to the field of software installation and therefore a skilled person would combine them as part of a normal design procedure.



Bescheid/Protokoll (Anlage)	Communication/Minutes (Annex)	Notification/Procès-verbal (Annexe)
Blatt Sheet Feuille	2	Anmelde-Nr.: 04 250 954.7 Application No.: 04 250 954.7 Demande n°:

2 Summary

- 2.1 The application does not meet the requirements of Article 84 EPC, because claims 1-20 are **not clear**.
- 2.2 The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of claims 1, 3-5, 8, 9, 11, 12, 14-16 and 19 is **not new** in the sense of Article 54(1) and (2) EPC.
- 2.3 Furthermore, the subject-matter of claims 2, 6, 7, 10, 13 and 16-20 is **not inventive** (Article 56 EPC).

3 Clarity

- 3.1 The term "*NT File Structure*" is unclear with regard to Article 84 EPC, since the abbreviation "NT" might change in the course of time or might be changed in the future. Therefore, the file system should be rather defined by its features rather than its product name. The term should be changed to "*NTFS, a file system having a master file table which allows associating multiple, permanently hidden secondary data streams, Alternate Data Streams, to the actual data stream, Primary Data Stream,*" (see description, page 1, line 11-23). After this definition, the name of the file system "NTFS" might be used in the following dependent claims.
- 3.2 The terms "*installation*", "*installer*" and "*install*" are vague with regard to Article 84 EPC. For the rest of this document it will be interpreted as "*copying one or more files to a target location on a storage medium*".

4 Novelty of claim 1

- 4.1 Documents **D1** and **D2** are regarded as closest prior art and are considered as one single document since **D1** directly references and mentions **D2** as source for a more detailed analysis on the installer features which are part of the subject-matter of the present claim.
D1 and **D2** disclose in the original wording of claim 1 (reference to the closest prior art is made in parentheses; the original wording of the claim is set in *italic font*):
 - 4.2 *A method for secure installation and operation of software, said method comprising:*
 - 4.3 *employing an NT File Structure logical volume (page 1, section "Alternate Data Streams", paragraph 1, line 2, "...In NTFS...");*
 - 4.4 *employing an installer (page 7, section "Security Implications of ADSs", paragraph 1, line 3-7, "...malware that takes advantage of ADSs (e.g. W2k.stream)...", the W2k.stream virus can be regarded as an installer since it*



copies itself to the computers harddisk thereby infecting it; for a detailed description; **D1** provides a link to a anti-virus site at **page 7, section "Security Implications of ADSs"**, **paragraph 1, line 6-7**, "...As a datapoint, all W2k.stream threat vectors were assessed "low" by Symantec (www.sarc.com/..."); the linked document is **D2**; furthermore, in **section "Origins"**, **line 4-9**, **D1** discloses that Alternate Data Streams were introduced for compatibility with Macintosh files and applications which use them as storage for their resources);

4.5 *writing a Primary Data Stream file to said NT File Structure logical volume from said installer* (**D2, page 2, section "technical details"**, **paragraph 4, line 3**, "...overwriting the host program with its own code..."; the virus creates a new Primary Data Stream file with this operation);

4.6 *associating data with said Primary Data Stream file* (**D2, page 2, section "technical details"**, **paragraph 4, line 4-5**, "...saves the original host application as a named stream of the host program...", and thereby associating it with the virus since from that moment on it will execute it whenever it get executed itself, see **D2, page 2, section "technical details"**, **paragraph 5, line 3**, "...the virus can execute the host program..."); and

4.7 *writing said associated data to said NT File Structure logical volume as an Alternate Data Stream file from said installer* (**D2, page 2, section "technical details"**, **paragraph 4, line 4-5**, "...the virus...saves the original host application as a named stream of the host program...").

4.8 Therefore, the subject-matter of claim 1 is **not new** and thus this claim is not allowable with regard to Articles 52(1) and 54 EPC. Should the applicant be able to identify minor differences or amend the claim by such differences which overcome the above novelty objection, then still the claim can not be considered to be allowable for lack of inventive step as required by Articles 52(1) and 56 EPC since Alternate Data Streams have been designed in order to install Macintosh applications on Microsoft operating systems having a Microsoft NTFS file system (**D1, section "Origins"**) thereby implying that installers not only copied the application file(s) but also copied and associated the Alternate Data Streams in order to provide compatibility to the Apple HFS+ file systems.

5 Novelty of independent system claim 11

5.1 Since independent claim 11 only contains features that correspond to those of claim 1, the objections concerning novelty of claim 1 **apply accordingly**.

6 Novelty of the dependent claims

6.1 **Dependent claims 3-5, 8, 9, 12, 14-16, 19** do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the EPC with respect to **novelty** (Article 54(1) and (2) EPC); the reasons being as follows (reference to the closest prior art is made



in parentheses; the original wording of the claim is set in *italic font*):

6.2 **Claim 3 and 14:** D1 discloses *writing* (page 3, line 8-9, "C:\...\test>echo "this is ...with file1.txt">file1.txt:second_ads.txt"), *reading* (page 3, line 18, "C:\...\test>more < file1.txt:second_ads.txt"); shows the reading of an Alternate Data Stream); or *manipulating* (**section "URL Pearls:"**, paragraph 3, line 1, "...The...utility that is ideal for ADS manipulation is <cp.exe>...") said Alternate Data Stream.

6.3 **Claim 4 and 15:** employing as said Primary Data Stream file an executable file (D2, page 2, section "technical details", paragraph 4, line 3, "...overwriting the host program with its own code...").

6.4 **Claim 5:** creating a Primary Data Stream directory chain; writing said Primary Data Stream directory chain to said NT File Structure logical volume from said installer (D1, page 2, line 20, "mkdir test"); shows how a simple directory chain is created consisting of one directory; creating more complex directory structures belongs to fundamental knowledge in the area of computing); writing said Primary Data Stream file to said Primary Data Stream directory chain in said NT File Structure logical volume from said installer (implicit in D1; furthermore, it is disclosed in the description of the W2k.stream virus in D2, page 2, section "technical details", paragraph 4, line 3, "...overwriting the host program with its own code..."); associating said data with said Primary Data Stream directory chain or said Primary Data Stream file by creating and closing said Alternate Data Stream file (D1, page 2, line 22-25, "C:\...\test>echo "this is an...subcategory" > :ads.txt", attaches an Alternate Data Stream to a directory and page 3, line 8-9, "C:\...\test>echo "this is ...with file1.txt">file1.txt:second_ads.txt"; attaches an Alternate Data Stream to a file).

6.5 **Claim 8:** D1 discloses two Alternate Data Streams being associated with an Primary Data Stream (page 2, line 34 - page 3, line 9).

6.6 **Claim 9:** displaying said associated data from said Alternate Data Stream file in said NT File Structure logical volume (page 3, line 18, "C:\...\test>more < file1.txt:second_ads.txt"; displays the Alternate Data Stream in the command prompt).

6.7 **Claim 12:** D2 discloses said NT File Structure logical volume includes a directory chain or a system directory; and wherein said installer installs said Primary Data Stream file in said directory chain or said system directory of said NT File Structure (page 3, line 8-9, "C:\...\test>echo "this is...with file1.txt">file1.txt:second_ads.txt"; "file1.txt" is located in folder "test"; furthermore it is obvious that a file needs to be located in a directory).

6.8 **Claim 16:** D1 discloses how to create a Primary Data Stream directory chain to said NT File Structure logical volume (page 2, line 20, "mkdir test"), to write said Primary Data Stream file to said Primary Data Stream directory chain in said NT File Structure logical volume (implicit, it is common knowledge how to create files in a file system); to associate said data with said Primary Data Stream directory



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chain (page 2, line 24-25, "...echo "this is....subdirectory" > :ads0.txt", this command attaches the text in quotes to the "test" directory) or said Primary Data Stream file (page 2, line 35-36, "...echo "this...file.txt" > file1.txt:first_ads.txt..."), and to install said associated data to said NT File Structure logical volume as said Alternate Data Stream file (implicit through page 2, line 35-36).

6.9 **Claim 19:** the display of the contents of Alternate Data Streams is disclosed in **D1** (**figure 1**).

7 Inventiveness of the dependent claims

7.1 With regard to documents **D1** and **D3**, the subject-matter of **dependent claims 2, 6, 7, 10, 13, 17, 18, 20** and the claims to which they refer, is **not inventive** (Article 56 EPC). Document **D3** describes the more fundamental aspects of an installation procedure, **D1** refers to specific details on the use of Alternate Data Streams for the installation procedure.

The detailed reasoning for the individual claims being as follows (reference to the closest prior art is made in parentheses; the original wording of the claim is set in *italic font*):

7.2 **Claims 2 and 13:** **D3** discloses *an installation log* (page 27, line 8, "...installation log..."), *an application configuration file* (page 27, line 1, "...the configuration file..."), *an error log* (page 27, line 2-4, "...the...vmware.log...of the virtual machine that had problems..."); implicitly states that this is the applications log file which logs errors), *help information* (page 37, line 35-36, "...manual files, documentation files..."). Database information files are just another embodiment a skilled person would use in the case of a database related application.

7.3 **Claims 6 and 17:** **D3** discloses *employing an installation file* (page 37, line 11, "...specifying the installation file...") *comprising said Primary Data Stream file* (page 37, line 35-36, "...binary files..."), *said Alternate Data Stream file* (disclosed in **D1**), *installation instructions* (page 33, top figure, discloses a window of the install wizard, displaying instructions on the top part of the window; furthermore it is common practise to display installation instructions before or during the installation procedure), *said Primary Data Stream directory chain* (page 37, line 35-36, "...Accept the default directories for binary files, library files, manual files, documentation files and init script..."), and *an End User License Agreement* (page 32, bottom figure).

The use of Alternate Data Streams for storage of application related data is already known from **D1**.

7.4 **Claims 7 and 18:** *displaying said installation instructions* (**D3**, page 33, top figure, discloses a window of the install wizard, displaying instructions on the top part of the window; furthermore it is common practise to display installation instructions before or during the installation procedure) and *End User License Agreement* (**D3**, page 32, bottom figure) *from said installation file*.



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7.5 **Claim 10 and 20:** D3 discloses employing an installation file (page 37, line 11, "...installation file..."); defining in said installation file a Primary Data Stream directory chain, said Primary Data Stream file (page 37, line 35-36, "...binary files..."), said Alternate Data Stream file (disclosed in D1), and at least one information file (page 32, bottom figure); displaying said at least one information file from said installation file (page 32, bottom figure); creating said Primary Data Stream directory chain in said NT File Structure logical volume; copying said Primary Data Stream file from said installation file to said Primary Data Stream directory chain in said NT File Structure logical volume (the creation of a directory chain and the copying of files is implicitly disclosed at page 37, line 36-37, "...Accept the default directories for binary files, library files, manual files..."); and copying said Alternate Data Stream file from said installation file to said Primary Data Stream directory chain in said NT File Structure logical volume (disclosed in D1).

8 Conclusion

- 8.1 It is not at present apparent which part of the application could serve as a basis for a new, allowable claim. Should the applicant nevertheless regard some particular matter as patentable, an independent claim should be filed taking account of Rule 29(1) EPC.
- 8.2 In case the applicant files a new set of claims, the applicant is requested to point out and discuss in his letter of reply any difference that would distinguish the subject-matter of the present application from what is disclosed in the available prior art. In particular, the applicant is requested to identify the technical problem that exists in the closest prior art, namely D1 and D2, describe how the applicant's invention solves this problem, and provide some argument for why this solution would not be obvious to a person skilled in the art.
- 8.3 When filing amended claims the applicant should at the same time bring the description into conformity with the amended claims. Care should be taken during revision, especially of the introductory portion and any statements of problem or advantage, not to add subject-matter which extends beyond the content of the application as originally filed (Article 123(2) EPC).
- 8.4 In order to facilitate the examination of the conformity of the amended application with the requirements of Article 123(2) EPC, the applicant is requested to clearly identify the amendments carried out, irrespective of whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based.
- 8.5 Reference signs in parentheses should be inserted in the claims to increase their intelligibility, Rule 29(7) EPC. This applies to both the preamble and characterising portion (see the Guidelines, C-III, 4.11).
- 8.6 The applicant is requested to effect the amendments by filing replacement pages for only those pages which have been amended. Unnecessary recasting of the



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description should be avoided. An amended abstract is not required.

- 8.7 The applicant should also take account of the requirements of Rule 36(1) EPC. If handwritten amendments are submitted, they should be clearly legible for the printer. In particular, fair copies of the amended pages should be filed in triplicate. Replacement pages containing handwritten amendments should also be filed in triplicate.
- 8.8 Moreover, it is considered as appropriate in the present case to draft the new independent claim in the two-part form as required by Rule 29(1) EPC, whereby the features known in combination from documents **D1** and **D2** should be placed in the preamble. If the applicant is of the opinion that a two-part form of the claim would be inappropriate he is invited to provide reasons in his reply. In addition, the applicant should ensure that it is clear from the description which features of the subject-matter of the new independent claim are known from documents **D1** and **D2**; see Guidelines C-III,2.3b.
- 8.9 To meet the requirements of Rule 27(1)(b) EPC, the documents **D1** and **D2** should be identified in the description and the relevant background art disclosed therein should be briefly discussed.

What is Claimed is:

1. A method for secure installation and operation of software, said method comprising:
 - employing an NT File Structure logical volume;
 - employing an installer;
 - writing a Primary Data Stream file to said NT File Structure logical volume from said installer;
 - associating data with said Primary Data Stream file; and
 - writing said associated data to said NT File Structure logical volume as an Alternate Data Stream file from said installer.
2. The method of Claim 1 further comprising
selecting said data from the group comprising an installation log, an application configuration file, an error log, help information, and database information.
3. The method of Claim 1 further comprising
writing, reading or manipulating said Alternate Data Stream file from an application program after said writing said associated data.
4. The method of Claim 1 further comprising
employing as said Primary Data Stream file an executable file.
5. The method of Claim 1 further comprising
creating a Primary Data Stream directory chain;
writing said Primary Data Stream directory chain to said NT File Structure logical volume from said installer;
writing said Primary Data Stream file to said Primary Data Stream directory chain in said NT File Structure logical volume from said installer;
associating said data with said Primary Data Stream directory chain or said Primary Data Stream file by creating and closing said' Alternate Data Stream file; and
installing said associated data to said NT File Structure logical volume as said Alternate Data Stream file from said installer.

6. The method of Claim 5 further comprising employing an installation file comprising said Primary Data Stream file, said Alternate Data Stream file, installation instructions, said Primary Data Stream directory chain, and an End User License Agreement.

7. The method of Claim 6 further comprising displaying said installation instructions and said End User License Agreement from said installation file.

8. The method of Claim 1 further comprising employing as said associated data first data; employing as said Alternate Data Stream file a first Alternate Data Stream file; employing second data; associating said second data with said Primary Data Stream file; and

writing said associated second data to said NT File Structure logical volume as a second Alternate Data Stream file from said installer.

9. The method of Claim 1 further comprising displaying said associated data from said Alternate Data Stream file in said NT File Structure logical volume.

10. The method of Claim 1 further comprising employing an installation file; defining in said installation file a Primary Data Stream directory chain, said Primary Data Stream file, said Alternate Data Stream file, and at least one information file;

displaying said at least one information file from said installation file;

creating said Primary Data Stream directory chain in said NT File Structure logical volume;

copying said Primary Data Stream file from said installation file to said Primary Data Stream directory chain in said NT File Structure logical volume; and

copying said Alternate Data Stream file from said installation file to said Primary Data Stream directory chain in said NT File Structure logical volume.

11. A computer system for secure installation and operation of software, said computer system comprising:

a processor;
a first drive adapted for access by said processor;
a second drive adapted for access by said processor, said second drive including an NT File Structure logical volume; and
an installer operatively associated with said first drive, said installer cooperating with said processor to write a Primary Data Stream file to said NT File Structure logical volume, associate data with said Primary Data Stream file, and write said associated data to said NT File Structure logical volume as an Alternate Data Stream file.

12. The computer system of Claim 11 wherein said NT File Structure logical volume includes a directory chain or a system directory; and wherein said installer installs said Primary Data Stream file in said directory chain or said system directory of said NT File Structure logical volume.

13. The computer system of Claim 11 wherein said data is selected from the group comprising an installation log, an application configuration file, an error log, help information, and database information.

14. The computer system of Claim 11 wherein said NT File Structure logical volume includes an application program, which cooperates with said processor to write, read or manipulate said Alternate Data Stream file.

15. The computer system of Claim 11 wherein said Primary Data Stream file is an executable file, which is adapted for execution by said processor.

16. The computer system of Claim 11 wherein said installer cooperates with said processor to create a Primary Data Stream directory chain, to write said Primary Data Stream directory chain to said NT File Structure logical volume, to write said Primary Data Stream file to said Primary Data Stream directory chain in said NT File Structure logical volume, to associate said data with said Primary Data Stream directory chain or said Primary Data Stream file, and to install

said associated data to said NT File Structure logical volume as said Alternate Data Stream file.

17. The computer system of Claim 11 wherein said installer comprises an installation file comprising said Primary Data Stream file, said Alternate Data Stream file, installation instructions, a Primary Data Stream directory chain, and an End User License Agreement.

18. The computer system of Claim 17 wherein said processor includes a display; and wherein said installer cooperates with said processor to display said installation instructions and said End User License Agreement on said display.

19. The computer system of Claim 11 wherein said processor includes a display; wherein said NT File Structure logical volume includes a display utility; and wherein said display utility cooperates with said processor to display said associated data from said Alternate Data Stream file in said NT File Structure logical volume on said display.

20. The computer system of Claim 11 wherein said processor includes a display; wherein said installer comprises an installation file including a Primary Data Stream directory chain, said Primary Data Stream file, said Alternate Data Stream file, and at least one information file; and wherein said installer cooperates with said processor to display said at least one information file from said installation file to said display, to create said Primary Data Stream directory chain in said NT File Structure logical volume, to copy said Primary Data Stream file from said installation file to said Primary Data Stream directory chain in said NT File Structure logical volume, and to copy said Alternate Data Stream file from said installation file to said Primary Data Stream directory chain in said NT File Structure logical volume.

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Term:	Definition:
benign virus	A virus that does not destroy programs or data, but displays a message, perhaps a humorous one, on the computer screen at certain times; intended as a harmless prank.
boot virus	A virus that infects a computer when the computer is booted from an infected disk. A boot virus may make it impossible to start the computer.
stealth virus	A virus that has ways of hiding itself so it is hard to detect.
virus	A program that can "infect" other programs by modifying them to include a, possibly evolved, copy of itself. A program that infects a computer by attaching itself to another program, and propagating itself when that program is executed. A computer can become infected by files downloaded over a network, or by the installation of new software or floppy disks that are infected with viruses. Some viruses are only pranks, and perform harmless actions like displaying a screen with a joke message on it. Others can destroy files or wipe out a hard drive. To avoid damage from viruses, write-protect the boot disk and other important disks, check new software or disks for viruses, and have virus protection software installed on the computer at all times. Disinfectant programs must be updated periodically because new viruses get into circulation over time. There are some virus protection programs available on the Internet for free. Knowingly spreading a computer virus is a crime punishable by law. See also Trojan horse and worm.
virus signature	The binary pattern of a virus, used by the antivirus program to detect and eliminate the virus.
Intended virus	This file/sector contains a program that "intends" to be a virus. It searches and tries to hit the files or sectors but fails, or the second generation of that "virus" can not replicate. Often these files are modified viruses or viruses that were compiled from not well debugged source files.
virus definitions	The list of viruses that the anti-virus program has the ability to detect. Anti-virus software companies usually post 'virus definitions' updates on their web sites.
virus hoax	A hoax is generally an email or newsgroup posting claiming that a new virus threat has been created when in fact it does not exist. The intent of the message is to scare other users into forwarding the false information to others, effectively spreading the hoax. If you receive a message about a virus from email or from a newsgroup contact either your IT/MIS department or the manufacturer of your anti-virus program before forwarding the message.

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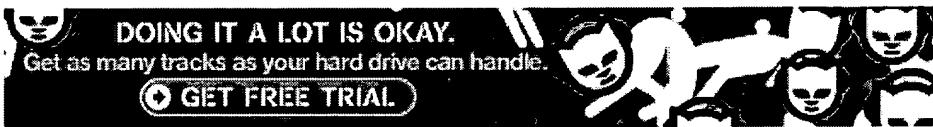
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A program or piece of code that is loaded onto your computer without your knowledge and runs against your wishes. Viruses can also replicate themselves. All computer viruses are manmade. A simple virus that can make a copy of itself over and over again is relatively easy to produce. Even such a simple virus is dangerous because it will quickly use all available memory and bring the system to a halt. An even more dangerous type of virus is one capable of transmitting itself across networks and bypassing security systems.

Since 1987, when a virus infected ARPANET, a large network used by the Defense Department and many universities, many antivirus programs have become available. These programs periodically check your computer system for the best-known types of viruses.

Some people distinguish between general viruses and *worms*. A worm is a special type of virus that can replicate itself and use memory, but cannot attach itself to other programs.

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Barracuda Networks: Virus Protection - Manufactures spam firewall products for enterprise email protection. Anti-spam networking appliance filters email without affecting the server.

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Downloadable virus scanning software 

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eSecurity Planet 

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McAfee virus information home page 

McAfee Associates specializes in network and security management. This page displays company news and product information, as well as links to virus descriptions and online technical support.

PC Housekeeping: Optimize With Maintenance 

Spring cleaning isn't just for dusty closets, and it isn't just for spring. Do you know what to do to keep your PC running at peak performance? Why not learn?

Symantec Antivirus Research Center 

The Symantec Antivirus Research Center offers a wealth of information on viruses. It begins with a list of hot topics (new virus and virus products), and also provides links to virus alerts,

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an information database, references, submit virus samples, Macintosh viruses, and Symantec virus product information.

The CERT/CC Home Page

Learn about the organizations mission and get up-to-date security information, security alerts and training information.

CIAC Virus Myth and Hoaxes Site

Created as a public service by the Computer Incident Advisory Capability (CIAC) to educate people about virus myths and hoaxes.

Computer Virus Myths

Contains information about the newest hoaxes as well as background on computer viruses and myths, opinions and editorials, and recommended books and Web sites.

Dr. Solomon's computer virus information site

This site is dedicated to users of Dr. Soloman's virus and information technology security products, and provides links to a virus information center, product and company information, and related Web links.

Hartmann's In-The-Wild Macro Virus List

Describes macro viruses reported by anti-virus software manufacturers.

How a Computer Virus Works

Explains the different types of viruses and how they work.

Overview of computer viruses and anti-virus software

Explains how viruses work and provides links to additional information about viruses and anti-virus software. Written and maintained by Bob Kanish.

SecurityTracker.com

Information on the latest security vulnerabilities, free SecurityTracker Alerts, and customized vulnerability notification services.

Virus Info Database

This is Symantec's Virus Info Database. You can search for a virus by name or refer to general virus information.

Virus Information Index

An alphabetical list of virus names which link to a summary and virus details.

VIRUS-L/comp.virus FAQ

Answers some frequently asked questions about computer viruses. This FAQ has been compiled by some of the main contributors to the Virus-L mailing list and its USENET news fan-out, comp.virus.

What Keeps Computers Safe

Here's the scoop on the differences between hardware and software firewalls, virus protection, and why you need them.

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Microsoft Getting Organized: Virus Protection - Microsoft's free "Slice the Spam" audio course details how Microsoft(R) Office Outlook(R) 2003 can help eliminate junk e-mail.

AdvisorMail: Virus Protection Software - Offers email storage, IM storage and monitoring solution. Searchable database allows retrieval of company emails, attachments and instant messages.

Everyone.net: Email Virus Protection - Teamed with Sophos to provide up-to-date virus and hoax protection to its Business Mail users.

Platform Logic: Virus Protection - Offers AppFire, virus protection software, designed to prevent attacks from known and unknown viruses and malicious insiders.

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